

An EFL flipped learning course design: utilizing students' mobile online devices

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Abstract. This paper reports on a research project in a university English as Foreign Language (EFL) program in Japan which explored ways to sustain active participation in e-learning tasks. The tasks were intended to improve students' scores on the Test of English for International Communication (TOEIC), a test used by businesses to make hiring decisions. The research adopted a Flipped Learning (FL) approach to Blended Learning (BL). A web-based courseware, ATR CALL BRIX (<http://www.ATR-lt.jp/products/brix/index.html>), which featured e-learning materials for the TOEIC Test, was used. The students used mobile devices to access the courseware before class in order to prepare for in-class teacher-student analysis of their performance on the learning tasks. The teaching methodology integrated the online and in-class tasks in a single learning environment by means of an e-mentoring system used in conjunction with an in-class student self-evaluation task. The findings of pre- and post-TOEIC testing showed a significant degree of TOEIC score improvement in the experimental group. Post-course evaluations revealed that the combination of e-mentoring and the in-class self-evaluation system had encouraged sustained engagement in outside-of-class learning activities.

Keywords: EFL, blended learning, flipped learning, MALL.

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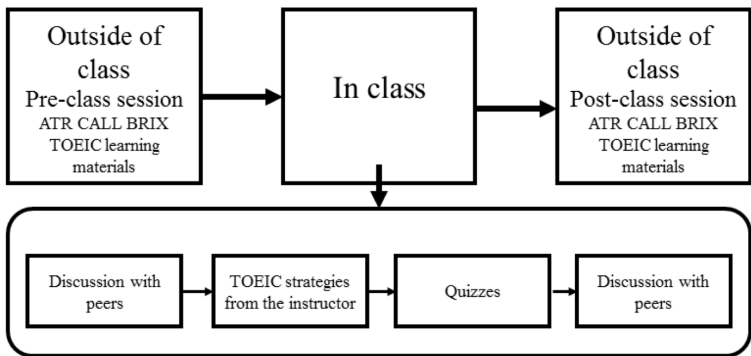
1. Introduction: flipped learning for foreign language education

BL is a combination of conventional classroom face-to-face delivery of lesson instruction with online-mediated instruction (Osguthorpe & Graham, 2003). FL is a BL teaching methodology which uses the two BL channels of communication to reverse the conventional patterns of classroom teaching and learning. FL rests on an assumption that students will use learning task materials before class, so that classroom time can be devoted to interaction between students and their teacher that will support the outside-of-class study through mutual problem-solving tasks and analytical examinations of learning materials. This study examined a FL approach to generating, and then sustaining, student motivation that would result in effective long-term use of on-line EFL learning materials.

Until recently, it has been expected that university students would mainly use laptop and desktop computers to access online learning materials at school and elsewhere. However, the use of a variety of mobile devices with online access, such as mobile phones and tablet computers, is now the preferred means of student-to-student online communication in some university communities. For example, 94.9% of students who will graduate in Japan in 2016 have smartphones compared with 16.4% of the 2012 graduates. More than 85% of these students use one Social Network System, LINE, not only to communicate with their friends but also as a source of information. In sharp contrast, only 11.2% of the 2016 graduating class use desk top computers as their main means of information acquisition (Mynavi, 2015). Thus, this research project explored a mobile assisted language learning medium of BL methodology.

2. Course design: the EFL flipped learning course

Figure 1. Procedure of activities in one session



In order to help students improve their TOEIC scores, an original two-semester EFL FL course was implemented from April 2014 to January 2015 at a university in Japan. Each learning unit had three phases: 1) pre-class online completion of TOEIC course materials; 2) individualized problem-solving instruction in class; and 3) post-class online completion of self-assessment and reflection learning tasks (see Figure 1).

2.1. ATR CALL BRIX

Outside of class, a www-based courseware, ATR CALL BRIX (<http://www.atri-jp/products/brix/index.html>), which included a Learning Management System (LMS), was used. The LMS provided a variety of learning materials designed to prepare students for the TOEIC Test. Seven different functions were featured on the LMS: 1) study logs, 2) feedback on the achievement rates of student-set goals, 3) records of the frequency of the use of the materials, 4) a record of time spent on learning, 5) a continuous update of the average score on the TOEIC learning tasks, 6) an evaluation of students' weak points and advice for further learning, and 7) students' rankings in comparison with other students in the course (Ishikawa et al., 2014).

2.2. A student self-evaluation system

A student self-evaluation system that was intended to contribute to the development of students' self-regulated learning attitudes, skills and behavior, and thus, sustain student use of the learning materials, was integrated in the courseware. The system combined e-mentoring in the LMS outside of class, and weekly in-class self-evaluations as part of the course routine. At the beginning of the first semester, students were placed in three groups – high, mid and low – according to their TOEIC scores. An e-mentoring team of one teacher and a teaching assistant sent different need-based messages of advice and encouragement to the students every week by means of a social networking system called LINE (<http://line.me/en/>). The messages were varied according to how successfully the students had completed the learning materials (Ishikawa et al., 2015).

3. Validation of the study

3.1. Participants

551 first-year students who enrolled in a TOEIC course participated in this study. 348 students were included in an experimental group and 203 students in a control

group. The students in the experimental group were placed in three groups – high, mid and low (mean \pm 0.5*SD*) – according to their scores of the TOEIC Test which they took at the beginning of the course.

3.2. Methods

For the experimental group, the course design described in section 2, above, was implemented. In the control group, students followed the same course design but they used neither the web-based courseware, ATR CALL BRIX, nor the self-evaluation system. All their learning materials were paper-based.

Pre- and post-TOEIC Tests were conducted before the course started and at the end of the second semester in January 2015. The experimental-group students took the TOEIC Test again at the end of the first semester in July 2014, in addition to the pre- and post-TOEIC Test. The students also completed course evaluations at the end of the second semester.

4. Results and discussion

4.1. TOEIC testing

The increase of TOEIC scores between the mid and low groups in the experimental group and the control group was compared. The high group in the experimental group was excluded because the average scores for the pre-test in both experimental and control groups should be comparable. The increase of the scores in the experimental group was 151.38 and that in the control group was 54.04. The scores of the post-test in the two groups was compared and there was a significant difference ($p<.001$; $d=.56$) as is shown in Table 1.

Table 1. Results of pre- and post-TOEIC testing

	Experimental			Control			<i>t</i>	<i>d</i>
	<i>Mean</i>	<i>SD</i>	<i>n</i>	<i>Mean</i>	<i>SD</i>	<i>n</i>		
Pre-TOEIC (April)	345.97	66.82	243	361.03	89.14	203	2.00 *	0.14
Post-TOEIC (January)	497.35	107.77	243	415.07	107.20	203	8.05 ***	0.56
* $p<.05$, *** $p<.001$								

Furthermore, students who took the TOEIC Test in April and July in 2014, and January in 2015 in each of the three groups of the experimental group improved their TOEIC scores by approximately 150 points from April in 2014 to January in 2015 as is shown in Table 2.

Table 2. Results of TOEIC testing of the three groups in the experimental group

	April		July		January		<i>n</i>
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	
High	511.95	61.21	603.38	81.75	652.38	86.43	105
Intermediate	393.89	28.71	507.17	71.91	543.44	96.14	122
Low	286.12	43.65	409.58	79.17	443.50	96.35	107

4.2. Post course student evaluation

The course evaluation for the experimental group conducted at the end of the second semester consisted of 20 questions (see Table 3). Four open-ended questions asked about the students' feelings about the course and the in-class activities, the problems that they may have found in using the LMS learning materials, and the messages sent by the e-mentor team. A 4-point Likert scale was used for the responses in order to adequately allow for the expression of a range of participants' feelings about the course. The ratings of 2 and 1 respectively corresponded to disagree, and strongly disagree; and the ratings of 3 and 4 respectively corresponded to agree, and strongly agree. The rate of reliability of the twenty 4-point Likert scale questions was high ($\alpha=.91$).

Table 3. Results of the questions in the participants' course evaluation

	<i>Item</i>	<i>Mean</i>	<i>SD</i>
1	The in-class activities helped improve my total TOEIC score.	3.26	0.79
2	The in-class activities helped improve my TOEIC listening score.	3.24	0.81
3	The in-class activities helped improve my TOEIC reading score.	3.17	0.84
4	The in-class activities helped improve my vocabulary.	2.90	0.84
5	The in-class activities helped improve my English listening skills.	3.19	0.82
6	The in-class activities helped improve my English reading skills.	3.00	0.85
7	In the in-class activities, I was able to solve problems that I found in the outside-of-class activities.	2.76	0.84
8	I was interested in the in-class activities.	2.82	0.89
9	I want to continue the in-class activities.	2.80	0.93
10	I used the learning materials in the LMS of the ATR CALL BRIX.	3.38	0.82
11	The learning materials in the LMS of the ATR CALL BRIX helped improve my total TOEIC score.	2.91	0.90
12	The learning materials in the LMS of the ATR CALL BRIX helped improve my TOEIC listening score.	3.05	0.86
13	The learning materials in the LMS of the ATR CALL BRIX helped improve my TOEIC reading score.	2.77	0.93
14	The learning materials in the LMS of the ATR CALL BRIX helped improve my vocabulary.	2.88	0.91
15	The learning materials in the LMS of the ATR CALL BRIX helped improve my English listening skills.	3.00	0.89
16	The learning materials in the LMS of the ATR CALL BRIX helped improve my English reading skills.	2.81	0.94
17	I was interested in using the learning materials in the LMS of the ATR CALL BRIX.	2.50	0.98
18	I want to continue using the learning materials in the LMS of the ATR CALL BRIX.	2.49	1.05
19	I often found some problems using the learning materials in the LMS of the ATR CALL BRIX.	2.51	1.03
20	The flipped learning lessons suited my own learning style.	2.67	0.87
<i>n</i> = 331			

As for the in-class activities, the participants were convinced that the activities were useful for strengthening their TOEIC listening and reading skills. Typical comments were similar to the following student's response: "I enjoyed the in-class activities. I was able to learn TOEIC test-taking strategies to improve my TOEIC scores". However, some participants did not feel that they were able to

solve problems that they had faced while using the LMS learning materials: “I don’t know why but I often had problems in using the learning materials”. There were other negative reactions to the use of the LMS: looking at the display screen hurt their eyes; and they found problems in using the learning materials at home.

However, the majority of the participants felt that the learning materials in the LMS helped improve their TOEIC scores. Some of the participants believed that the FL approach in the study suited their own learning styles: “The encouragement from the teacher let me continue the outside-of-class activities, I really think so”.

5. Conclusion

The results of the pre- and post-TOEIC testing showed that the EFL FL course design for the experimental group was more effective in helping students improve their TOEIC scores than the course design for the control group, and that the students at all TOEIC-score levels in the experimental group improved their TOEIC scores by an average of approximately 150 points. Moreover, the study revealed that the self-evaluation system encouraged students to sustain engagement in outside-of-class e-learning learning activities. Further research should be conducted to investigate the most productive uses of mobile devices for e-learning.

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